

## PREY RECORDS FOR SOME NORTH AMERICAN SPIDER WASPS (HYMENOPTERA: POMPILIDAE)

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In the course of recent investigations on the Pompilidae of California, I have had the opportunity to examine material in several western collections of these wasps. Some of the specimens were pinned with or otherwise associated with their spider prey. The records are presented here because, in general, the biology of the North American Pompilidae is not well known and because prey was previously unknown for some of the species. Depositories for wasps and prey are as follows: California Academy of Sciences, San Francisco (CAS); California Department of Food and Agriculture, Sacramento (CDFA); California Insect Survey, University of California, Berkeley (CIS); Oregon State University, Corvallis (OSU); University of California, Davis (UCD). Dr. Willis J. Gertsch, Portal, Arizona, kindly identified the spiders, except for *Anyphaena pacifica* (Banks) which was determined by Mr. L. Vincent, University of California, Berkeley. Dr. Gertsch also provided comments on some of the spiders which have been included where appropriate.

### *Cryptocheilus severini* Banks

*Prey.*—*Lycosa coloradensis* Banks (Lycosidae). Female.

*Collection data.*—Arizona, Cochise Co., T17S-R31E-S3, October 20, 1958. The specimen carries two additional labels—"Larrea" and "273" (CIS).

This represents the first prey record for *C. severini* and the first record of *Lycosa coloradensis* as prey of any North American species of *Cryptocheilus*, although species of *Lycosa* are the only prey thus far recorded for this genus in our fauna.

### *Priocnemis (Priocnemis) cornica* (Say)

1. *Prey.*—*Agroeca* sp. (Clubionidae). Immature.

*Collection data.*—California, Sacramento Co., Sacramento (river levee near Wheeler's Landing), June 6, 1965 (M. Wasbauer, CDF A).

2. *Prey.*—*Pardosa* sp. (Lycosidae). Immature.

*Collection data.*—Missouri, Columbia, October 27, 1966 (F. D. Parker, CDF A).

Host spiders of six families have been recorded for this rather nonselective wasp (Evans and Yoshimoto, 1962:96; Kurczewski and Kurczewski, 1968: 3–4). Species of *Pardosa* have been reported as prey several times. *Agroeca* is the third genus of Clubionidae known to be utilized.

*Auplopus architectus metallicus* (Banks)

*Prey.*—*Metaphidippus aeneolus* (Curtis) (Salticidae). Female.

*Collection data.*—California, Contra Costa Co., Orinda Village, San Pablo Ridge below Eureka Peak, 1000–2000 feet, Oak-chaparral zone, May 25, 1972 (E. I. Schlinger, CIS).

Prey previously recorded for this subspecies include members of the Salticidae and Clubionidae (Hurd and Wasbauer, 1956:169; Kurczewski, 1961: 23–24; Evans and Yoshimoto, 1962:109).

*Auplopus nigrellus* (Banks)

*Prey.*—*Chiracanthium* sp. (Clubionidae). Immature.

*Collection data.*—California, Stanislaus Co., La Grange, October 30, 1979 (R. P. Allen, CDF).

This species of *Auplopus* occurs across the United States. It is characteristic of woodland situations and has been recorded as provisioning with Salticidae, Anyphaenidae and Clubionidae in the eastern portion of its range. Previous records of Clubionidae are *Trachelas* sp. prob. *tranquillus* (Hentz), immature (Krombein, 1955:15) and *Clubiona abboti* L. Koch, immature female (Kurczewski and Kurczewski, 1968a:369).

*Ageniella (Priophanes) arizonica concolor* Townes

*Prey.*—*Oxyopes* sp. near *tridens* Brady (Oxyopidae). Female.

*Collection data.*—Oklahoma, Lake Texoma, 2 miles east of Willis, July, 1965 (R. M. Bohart, UCD).

There are no previous prey records for this species of *Ageniella*, but the related *A. arcuata* (Banks) and *A. fuscipennis* Townes have both been taken with *Oxyopes salticus* Hentz (Evans and Yoshimoto, 1962:107; Hurd and Wasbauer, 1956:169).

*Aporus (Aporus) luxus* (Banks)

A male specimen in the CIS collection taken in California at Point Reyes National Seashore on January 18, 1976, by Paul Rude is pinned with a cocoon and bears a label which reads “Ex. *Apostichus* (!) nest. Emerged 17-II-1976.” The spider in this case is probably *Aptostichus stanfordianus* Smith (Ctenizidae) which is found in dune areas along the central California coast and is also taken as prey by *Aporus (Plectraporus) hirsutus* (Banks) (Williams, 1928:136).

This record is of significance since it is the first indication of prey for any North American species in the subgenus *Aporus*.

*Agenioideus (Agenioideus) humilis* (Cresson)

*Prey*.—*Araneus bispinosus* (Keyserling) (Araneidae). Immature female.

*Collection data*.—California, Marin Co., Mill Valley, October 20, 1960 (E. S. Ross, CAS).

Prey thus far recorded for *A. humilis* have all been araneid spiders (Evans and Yoshimoto, 1962:88). Eberhard (1970:243) provided a record for *Araneus cornutus* Clerck in Florida.

*Sericopompilus neotropicalis* (Cameron)

*Prey*.—*Misumenops* sp. (Thomisidae). Female.

*Collection data*.—Arizona, Cochise Co., 2.5 miles southeast of Portal, July 31, 1960 (E. G. Linsley, CIS).

Prey have not been recorded previously for this common spider wasp, although eleven genera of spiders in five families are known to be taken as prey by the related *S. apicalis* (Say) of the eastern United States (Evans and Yoshimoto, 1962:90).

*Episyron quinquenotatus hurdi* Evans

1. *Prey*.—*Argiope trifasciata* (Forsk.) (Araneidae). Immature female.

*Collection data*.—Nevada, Lincoln Co., Caliente, July 21, 1958 (R. C. Bechtel, UCD).

2. *Prey*.—*Metepeira arizonica* Chamberlin and Ivie (Araneidae). Female.

*Collection data*.—California, Imperial Co., Black Mountain, 4–5 miles southeast Highway 78, 1300–1500 feet, March 28, 1978 (E. Fisher, CDF).

Although there is some information on the prey and nesting behavior of the nominate subspecies of *Episyron quinquenotatus* in the eastern U.S. (Evans and Yoshimoto, 1962:91–92; Kurczewski and Kurczewski, 1968:9–12, 1968a:370, 1973:67) there are no previous records of prey for the subspecies *hurdi*.

*Tachypompilus ferrugineus burrus* (Cresson)

*Prey*.—*Cupiennius salei* (Keyserling) (Ctenidae). Female.

*Collection data*.—Mexico, Veracruz, La Playa Escondida, 16 km north Sontecomapan, Sierra de las Tuxtlas, August 2–9, 1980 (L. G. Bezark, C. Y. Kitayama, CDF).

Although the Nearctic subspecies of *T. ferrugineus* show a preference for large lycosid spiders, *Dolomedes* (Pisauridae) has been recorded as prey (Evans and Yoshimoto, 1962:87). Thus, it is not surprising that Ctenidae would be taken by a Neotropical subspecies since they are wandering spiders

which hunt along the ground and over foliage, somewhat in the manner of Lycosidae. According to Gertsch (in litt.) "The spider is common in Mexico, Central America, West Indies and Brazil."

*Tachypompilus ferrugineus ferrugineus* (Say)

*Prey.*—*Lycosa helluo* Walckenaer (Lycosidae). Immature female.

*Collection data.*—Kansas, Clearwater, August 9, 1971 (CDFA).

This species has been reported previously taking *L. helluo* as prey in Kansas (Evans and Yoshimoto, 1962:87).

*Anoplius (Pompilinus) insolens* (Banks)

*Prey.*—*Tibellus gertschi* Chamberlin and Ivie (Philodromidae). Female.

*Collection data.*—Utah, Cache Co., Smithfield, July 18, 1958 (R. W. Thorp, WJG, CIS).

There is one previous record of prey for this species, a female of the salticid spider, *Maevia vittata* (Hentz) which Evans (1951:306) collected at East Hartford, Connecticut.

Gertsch states (in litt.) that philodromid crab spiders of the genus *Tibellus* are elongate, grassland species which frequently cling to stems. *T. gertschi* is not a commonly encountered species.

*Anoplius (Pompilinus) marginatus* Complex

*Prey.*—*Arctosa* sp. (Lycosidae). Female.

*Collection data.*—North Dakota, Case Co., 10 miles east of Enderlin, August 18, 1964 (J. R. Powers, CIS).

Females of *A. (P.) bequaerti* and *townesi* are not separable at present from those of *marginatus*. Thus, the record given here may refer to any of the three.

There are now many host records available for this complex (Evans and Yoshimoto, 1962:79; Kurczewski and Kurczewski, 1968:19–20, 1968a:373–374) and *Arctosa* sp. has been recorded previously.

*Anoplius (Pompilinus) splendens* (Dreisbach)

*Prey.*—*Phidippus cardinalis* (Hentz) (Salticidae). Male.

*Collection data.*—Missouri, Columbia, July 30, 1967 (F. D. Parker, CDF A).

Due mainly to the efforts of Frank and Edmund Kurczewski (1968, 1968a, 1973), there have now accumulated a number of prey records for this species which is common in the eastern United States. The range of prey is unusually wide and encompasses the following families: Agelenidae, Amaurobiidae, Araneidae, Clubionidae, Gnaphosidae, Lycosidae, Pisauridae, Salticidae and Thomisidae.

In the Salticidae, the genera *Habronattus*, *Pellenes*, *Marpissa* and *Phidippus* are represented.

*Anoplius (Anoplius) dreisbachi* Evans

*Prey.*—*Alopecosa kochi* (Keyserling) (Lycosidae). Female.

*Collection data.*—Utah, Salt Lake City, October 15, 1914 (L. P. Rockwood, OSU).

There are no previous prey records for this wasp which is relatively common in the west but Powell (1958:55) reports a female of *Alopecosa gertschi* Schenkel as prey of the closely related *Anoplius (A.) toluca* (Cameron), near Pittsburg, Contra Costa County, California.

*Anoplius (Anoplius) imbellis* Banks

*Prey.*—*Schizocosa mccoocki* (Montgomery) (Lycosidae). Immature.

*Collection data.*—Utah, Salt Lake City, October 14, 1914 (L. P. Rockwood, OSU).

Wasbauer (1957) studied the behavior of this wasp in two California localities. In both areas, the prey was *Pardosa ramulosa* McCook. In presenting a record for an undetermined species of *Pardosa* as prey of *A. imbellis*, Wasbauer and Powell (1962:399) suggested a narrow range of prey preference because the wasp seems to show a restrictive hunting habitat selection. Subsequent prey records (Evans and Yoshimoto, 1962:85; Kurczewski and Kurczewski, 1968:22, 1973:72) although all Lycosidae, indicate a somewhat wider range of preference than was suspected initially.

*Anoplius (Anoplius) ithaca* (Banks)

*Prey.*—*Pardosa lowriei* Kronestedt (Lycosidae). Female.

*Collection data.*—California, Placer Co., Chinquapin, 3 miles northeast Tahoe City, June 25 to 29, 1979 (P. Adams, CDFA).

I am informed by Ms. Adams that the wasp was dragging the spider along the ground between rocks on a boulder-strewn section of stream bank.

As far as existing knowledge goes, *Anoplius ithaca* seems to be restricted in its prey preferences to members of the family Lycosidae. Only two genera have been recorded, *Arctosa* and *Pardosa* (Evans and Yoshimoto, 1955:19, 1962:83; Krombein, 1956:42; Kurczewski, 1962:89, 1975:148; Kurczewski and Kurczewski, 1968:22, 1973:72). Evans and Yoshimoto report an immature specimen of *Lycosa* sp. being fed upon by a female of *ithaca*.

*Pompilus (Ammopshex) luctuosus luctuosus* Cresson

*Prey.*—*Anyphaena pacifica* (Banks) (Anyphaenidae). Female.

*Collection data.*—California, Marin Co., Point Reyes National Seashore, North Beach, June 2, 1979 (L. Vincent, CIS). Two wasps were taken at this locality and date. Both were transporting adult females of *A. pacifica*.

There have been no records of prey previously reported for *Pompilus l. luctuosus*. Anyphaenid spiders are not commonly recorded as prey of Pom-

pilidae. There are records of species of *Anyphaena* as prey of the mud-nest building genus *Auplopus* and the *Anoplius marginatus* complex and of the related spider, *Aysha gracilis* (Hentz) preyed upon by species of *Sericopompilus*, *Priocnemis* and *Auplopus* (Evans and Yoshimoto, 1962:116; Kurczewski and Kurczewski, 1968:4, 6).

*Pompilus (Archnospila) arctus* Cresson

1. *Prey*.—*Gnaphosa muscorum* (L. Koch) (Gnaphosidae). Female.

*Collection data*.—California, Nevada Co., Sagehen Creek, July 11, 1975 (B. Villegas, UCD).

2. *Prey*.—*Cybaeus* sp. (Agelenidae). Immature.

*Collection data*.—California, Contra Costa Co., Orinda Village, San Pablo Ridge below Eureka Peak, 1000–2000 feet, Oak-chaparral zone, July 15, 1969 (E. I. Schlinger, CIS). Two wasps were taken at this locality and date, both transporting immatures of *Cybaeus*.

Although Evans and Yoshimoto (1962:86) report the use of Gnaphosidae (*Orodassus*) as prey of this pompilid, the genus *Gnaphosa* has not been reported previously. Likewise, the use of Agelenidae has not been reported. In fact, the genus *Cybaeus* was hitherto unknown as prey of any North American spider wasp.

*Pompilus (Archnospila) fumipennis eureka* (Banks)

1. *Prey*.—*Lycosa* sp. (Lycosidae). Immature.

*Collection data*.—California, Tuolumne Co., Sonora Pass, August 23, 1967 (R. W. Thorp, UCD).

2. *Prey*.—*Alopecosa kochi* (Keyserling) (Lycosidae). Female.

*Collection data*.—California, Arcata, dunes, June 3, 1976 (D. M. Gordon, CDFA).

All prey records to date are for Lycosidae. Wasbauer and Powell (1962:400) list *Alopecosa kochi* (reported as *Tarentula kochi*) as prey from two California localities and Evans (1951:268) reports *Lycosa* sp. from Cloudcroft, New Mexico.

*Pompilus (Archnospila) scelestus* Cresson

1. *Prey*.—*Schizocosa pacifica* (Banks) (Lycosidae). Immature male.

*Collection data*.—California, Santa Barbara Co., Santa Cruz Island, La Cascada, May 8, 1968 (D. S. Horning, UCD).

2. *Prey*.—*Schizocosa pacifica* (Banks). Immature female.

*Collection data*.—California, Santa Barbara Co., Santa Cruz Island, Cañada del Medio, May 27, 1969 (J. E. Slansky, UCD).

This species is known to take spiders of three families: Lycosidae, Pisauridae and Salticidae. Lycosid prey reported previously are *Lycosa gulosa*

Walckenaer, *L. frondicola* Emerton (Evans, 1951:264, 1970:483) and *Geolycosa raphaelana* (Chamberlin) (Gwynne, 1979:685).

*Aporinellus completus* Banks

*Prey.*—*Pellenes* sp. (Salticidae). Female.

*Collection data.*—California, San Mateo Co., six miles northeast of Gazos Creek Station, May 14, 1967 (J. Doyen, CIS).

There are several records of this species utilizing salticid spiders as prey. Evans (1959:76) gives *Pellenes oregonensis* Peckham (female) at Sierraville, California. Kurczewski and Kurczewski (1968a:377) give two records of *Pellenes viridipes* (Hentz) at Presque Isle State Park, Pennsylvania.

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South American species of the subgenus *Anisotarsus* Chaudoir (genus *Notiobia* Perty:Carabidae:Coleoptera). Part I: Taxonomy and natural history. By Gerald R. Noonan. Milwaukee Public Museum, Contributions in Biology and Geology, Number 44, 84 pp., 70 figs. Publication date on cover (confirmed by Mary Garity, Editor) cited as "November 2, 1981." ISBN 0-89326-071-1. Price: \$5.75 paper.

South American species of the subgenus *Anisotarsus* Chaudoir (genus *Notiobia* Perty:Carabidae:Coleoptera). Part II: Evolution and biogeography. By Gerald R. Noonan. Milwaukee Public Museum, Contributions in Biology and Geology, Number 45, 117 pp., 21 figs. Publication date on cover (confirmed by Mary Garity, Editor) cited as "December 1, 1981." ISBN 0-89326-072-X. Price: \$6.75 paper.

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